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Children's Perception of Interparental Conflict Scale (CPIC): Factor Structure and Invariance Across Adolescents and Emerging Adults

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The Children's Perception of Interparental Conflict Scale (CPIC) is based on the cognitive-contextual framework for understanding interparental conflict. This study investigates the factor validity and the invariance of two factor models of CPIC within a sample of Portuguese adolescents and emerging adults (14 to 25 years old; N = 677). At the subscale level, invariance analyses (configural and metric) showed that the three-factor model with seven subscales operated equivalently across adolescents and emerging adults, although noninvariant intercepts emerged when testing scalar invariance. Confirmatory factor analyses (at the item and subscale level) and follow-up model fit indices supported the theory-based factor structure of the CPIC's original model.

Keywords: adolescents, confirmatory factor analysis, emerging adults, interparental conflict, invariance analysis

INTRODUCTION

Empirical studies have identified several mechanisms that may account for the associations between interparental conflict and maladjustment in children, including

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traumatic stress, physical and psychological symptoms, academic problems, social competence, and the internalization and externalization of problems (Amato & Keith, 1991; Cummings & Davies, 1994; Emery, 1982; Forehand, Neighbors, Devile, & Armistead, 1994; Franklin, Janoff-Bulman, & Roberts, 1990; Grych, Harold, & Miles, 2003; Grych, Jouriles, Swank, McDonald, & Norwood, 2000; Harold & Conger, 1997). Children's behavior can be influenced by interparental conflict both directly, through modeling and exposure to stress, and indirectly, through changes in the parent-child relationship.

Unfortunately, most available studies on the effects of interparental conflict on children have typically examined parents' reports of conflict, and few studies have assessed children's perception of interparental conflict (for exceptions, see Bickham & Fiese, 1997; Emery & O'Leary, 1982; Johnson & O'Leary, 1987; McDonald & Grych, 2006). Children's appraisals are likely to be more proximal to their own functioning, because such appraisals reflect their cognitive and emotional processing of relationship processes (Grych & Fincham, 1990), and, as such, should be better predictors of the effects of interparental conflict on children's development than are parent's reports of marital conflict (Emery & O'Leary, 1982). In order to explore these possibilities more fully, it is necessary to examine the processes that occur when children observe parental conflict, not only in terms of its frequency (Grych & Fincham, 1990) but also in terms of other conflict dimensions, such as the content of the conflict (Hanson, Saunders, & Kristner, 1992), the extent to which it threatens their own and their family's well-being and how it is resolved (Kempton, Thomas, & Forehand, 1989).

Grych and Fincham (1990) developed a cognitive-contextual framework for understanding the association between marital conflict and child adjustment. They proposed that four components of perceived interparental conflict (intensity, content, duration, and resolution) have important effects on how children understand and cope with such conflict: (1) the *intensity* of the conflict relates to the degree of negative affect or hostility expressed and the occurrence of physical aggression; (2) the specific *content* of the conflict relates to the perception of being involved, blamed, or triangulated in the interparental conflict; (3) the *duration* of the conflict relates to the length of time children are exposed to a stressful situation; and (4) the *resolution* of the conflict relates to the perception that parents are unable to constructively deal with conflict. When conflicts are resolved successfully and constructively, parents transmit to their children effective models and skills for problem resolution, which may facilitate children in their relationships with others, allowing them to generalize these conflict-resolution styles to subsequent peer relationships.

Based on Grych and Fincham's (1990) cognitive-contextual model, the Children's Perception of Interparental Conflict Scale (CPIC; Grych, Seid, & Fincham, 1992) was designed to assess these component processes. Although the scale was

originally developed using an American sample, several studies have more recently been conducted with European (Bringhenti, 2005, Italian sample; Godde & Walper, 2001, German sample; Iraurgi et al., 2008, Spanish sample; Ulu & Fisiloglu, 2002, 2004, Turkish sample; Vairami & Vorria, 2007, Greek sample), and Asian samples (Chi & Xin, 2003; Liping & Ziqiang, 2003; Mei & Zhongjian, 2006). Research on the factor equivalence of the CPIC across cultures will help researchers identify similarities and differences in the factor structure of the CPIC, allowing for a more refined subsequent comparison and discussion of the results found in different countries. In addition, once the equivalence of factor structure is guaranteed, it is also possible to cross-culturally investigate the relationships established with other variables. Cultural context could, in fact, be a critical factor in this line of inquiry, as socialization processes, family values, and parenting practices may differ from one culture to another. Like in other collectivist cultures, relationships and tradition play an important role for Portuguese people (Hofstede, 2001), and the impact of this kind of cultural expectations about interpersonal relationships needs further cross-cultural and empirical attention.

The way children, adolescents, and emerging adults perceive their interpersonal relationships and the existence of conflictual interactions in the family is also dependent on their developmental stage and cognitive maturity. Research has found age differences in the relation between children's conflict appraisals and adjustment (Jouriles, Spiller, Stephens, McDonald, & Swank, 2000; McDonald & Grych, 2006) as well as a somewhat different dimensional factor structure in a sample of young adults (Bickham & Fiese, 1997). In fact, developmental changes in children's cognitive capacities and experiences should influence how children perceive interparental conflict, how threatened they are by such conflict, their attributions regarding the cause of the conflict, and their perceived efficacy in coping with it. As previous research suggests, younger children are more likely to blame themselves for marital disruption than are older children (Grych & Fincham, 1990). By contrast, the perceived threat of conflict seems to be more relevant than conflict properties in terms of the adjustment of late adolescents. When children grow older, they have more problem-focused responses to conflict due to their greater ability to understand threats associated with interparental conflict.

In summary, there is a need to extend validity support for the CPIC by examining its factor structure not only among children at different developmental levels but also within cultural groups that are distinct from those included in the original CPIC validation. To that end, the main objective of this study is to examine the factor validity of the CPIC within independent samples of Portuguese adolescents and emerging adults. Before presenting our methods and findings, the following section describes the questionnaire and briefly summarizes key findings from previous studies using this measure.

THE CHILDREN'S PERCEPTION OF INTERPARENTAL CONFLICT SCALE

Based on Grych and Fincham's (1990) cognitive-contextual model, Grych, Seid, and Fincham (1992) developed the Children's Perception of Interparental Conflict Scale (CPIC), a theory-based instrument that measures specific aspects of interparental conflict from the child's perspective. The CPIC consists of 48 items organized into nine subscales: Frequency ("I often see my parents arguing."), Intensity ("When my parents have an argument they yell a lot."), Resolution ("Even after my parents stop arguing they stay mad at each other."), Threat ("I get scared when my parents argue."), Coping Efficacy ("I don't know what to do when my parents have arguments."), Content ("My parents often get into arguments about things I do at school."), Self-Blame ("It's usually my fault when my parents argue."), Triangulation ("I feel like I have to take sides when my parents have a disagreement."), and Stability ("My parents have arguments because they are not happy together.").

Grych et al. (1992) evaluated the validity of these nine subscales of CPIC, performing an exploratory factor analysis (generalized least squares and oblimin rotation) on two samples of children (9 to 12 years old) and a confirmatory factor analysis (CFA), both at the subscale level. They also tested the internal consistency of the nine subscales (see values in Table 1) and a test-retest correlations over two weeks interval (Conflict Properties = .70; Threat = .68; Self-Blame = .76). In the exploratory factor analysis the authors observed that Stability and Triangulation were not as consistent as the other subscales in their loadings across the two original independent samples. In the first sample, Stability loaded on the Conflict

TABLE 1
Descriptive Statistics and Internal Consistency

	Our Sample		Grych et al. (1992)		Bickham and Fiese (1997) α
	M (SD)	α	α Sample 1	α Sample 2	
Conflict Prop.	2.83 (.94)	.92	.90	.89	.95
Frequency (6 items)	2.96 (1.00)	.75	.70	.68	
Intensity (7 items)	2.72 (.99)	.84	.82	.80	
Resolution (6 items)	2.83 (.87)	.86	.83	.82	
Threat	3.12 (.83)	.79	.83	.83	.88
Threat (6 items)	3.10 (1.16)	.81	.82	.83	
Coping Eff. (6 items)	3.15 (.86)	.66	.69	.65	
Self-Blame	2.18 (.75)	.76	.78	.84	.85
Content (4 items)	2.10 (.87)	.72	.74	.82	
Self-Blame (5 items)	2.26 (.81)	.57	.61	.69	
Triangulation (4 items)	2.29 (.85)	.60	.71	.62	
Stability (4 items)	2.15 (1.14)	.79	.65	.64	

Properties factor and Triangulation loaded on the Threat factor, while in the second sample, Stability and Triangulation both loaded on the Self-Blame factor. Because Stability and Triangulation did not load consistently on a particular component, the authors decided not to integrate them into the final version with three scales and seven subscales, suggesting that they should be viewed separately as independent scales. This three-factor model accounted for approximately 72% of the variance for both samples.

The seven subscales that showed consistent factor loadings across the two samples are therefore incorporated into three analytically derived broad factor scales: *Conflict Properties* (Frequency, Intensity, and Resolution), *Threat* (Threat and Coping Efficacy) and *Self-Blame* (Content and Self-Blame). Children respond to each item using a 3-point scale (true, sort of true, false). The *Conflict Properties* scale (19 items) reflects conflict that occurs regularly, involves higher levels of hostility, and is poorly resolved. The *Threat* scale (12 items) measures the degree to which children feel threatened by and are able to cope with interparental conflict when it occurs. Finally, the *Self-Blame* scale (9 items) assesses the frequency of child-related conflict and the degree to which children blame themselves for interparental conflict. Reverse-scored items are: *Conflict Properties* (items 1, 2, 12, 18, 26, 27, 35, and 38), *Self-Blame* (items 8 and 47) and *Threat* (items 5 and 22).

Later, Bickham and Fiese (1997) used this instrument in a sample of late adolescents between the ages of 17 and 21, and found a factor structure at the subscale level (principal components extraction and promax rotation) that was, in general, consistent with the one proposed by Grych and colleagues (1992). In contrast to the results obtained by Grych et al. (1992), Bickham and Fiese (1997) found that a significant relationship exists between Triangulation and Stability for late adolescents, as these two subscales produced significant loadings on the Conflict Properties factor. This three-factor model with nine subscales proposed by Bickham and Fiese (*Conflict Properties* factor*:* Frequency, Intensity, Resolution, Triangulation and Stability; *Threat* factor: Threat and Coping Efficacy; and *Self-Blame* factor: Content and Self-Blame) accounted for 80% of the variance and demonstrated adequate internal consistency (see values in Table 1) and test-retest reliability over a two week period (Conflict Properties = .95; Threat = .86; Self-Blame = .81). The authors suggested that Triangulation and Stability may have a different meaning for late adolescents than for children, as they seem to be more easily understood by late adolescents, suggesting that these subscales may require greater cognitive sophistication to be properly interpreted.

Several studies have used the CPIC and in most cases have shown adequate internal consistency (Bickham & Fiese, 1997; Chi & Xin, 2003; Cummings, Davies, & Simpson, 1994; Dadds, Atkinson, Turner, Blums, & Lendich, 1999; Grych, Fincham, Jouriles, & McDonald, 2000; Grych et al., 2003; Grych, Raynor, & Fosco, 2004; Harold, Fincham, Osborne, & Conger, 1997; Kline, Wood, & Moore, 2003; Reese-Weber & Hesson-McInnis, 2008; Skopp, McDonald, Manke, & Jouriles, 2005; Ulu & Fisiloglu, 2002, 2004).

More recently, the CPIC's factor structure was evaluated through a confirmatory factor analysis at the item level (the nine subscales were represented as latent variables in the factor model) and also across developmental periods using invariance analysis. Reese-Weber and Hesson-McInnis (2008) used the original Grych et al. (1992) sample of early adolescents and a new sample of late adolescents to compare factor structure between these two developmental periods. The results suggested that the factor structure at the item level was similar across early and late adolescents, indicating that the nine subscales are separate aspects of interparental conflict for both developmental groups. At the subscale level, results suggested that a five-factor model (Conflict Properties, Threat, Self-Blame, Triangulation and Stability) demonstrated a better fit than the three-factor model with nine subscales proposed by Bickham and Fiese (1997). Recall that in this last three-factor model, Stability and Triangulation subscales were included in the Conflict Properties factor. Similarly, Nigg and colleagues (2009) evaluated the factor structure at the item level in a sample of children and adolescents (6 to 18 years old) with attention-deficit/hyperactivity disorder and disruptive behavior disorders. An exploratory factor analysis (maximum likelihood extraction and oblique rotation) and a confirmatory factor analysis suggested a final solution of 38 items organized into four factors (Conflict Properties, Threat to Self, Self-Blame, and Triangulation/Stability). The authors also conducted a multiple group analysis to evaluate whether the four-factor solution adjusted as well in the younger group (6 to 9 years old) as in the older group (10 to 18 years old). The results yielded an acceptable fit on the basis of the Root Mean Square Error of Approximation (RMSEA) value and a marginal fit on the basis of Comparative Fit Index (CFI) and Tucker-Lewis Fit Index (TLI) values.

In summary, according to empirical studies on the factor structure of the instrument, three, four, and five-factor solutions have been found to best represent the underlying structure of the CPIC. Although in general the subscales tend to aggregate in predictable terms to the same underlying dimensions, Triangulation and Stability seem to present varying behaviors. In the present study, we tested two different factor structures (Model 1 and Model 2) on a Portuguese sample using confirmatory factor analysis and invariance analysis: Model 1, a three-factor solution with seven subscales, as proposed in the original study (Grych et al., 1992); and Model 2, a three-factor solution with nine subscales, as proposed by Bickham and Fiese (1997). Similar to these two original models we tested the factor structure at the subscale level (CFA and invariance analysis), and then progressed into a more refined analysis, testing the model that adjusted at the item level.

This study can be considered unique relatively to the others CPIC's studies because it tests CPIC at the item level using a CFA approaches (CFA and bifactor CFA) and tests invariance based on the analysis of mean and covariance structures (MACS) while others only used analysis of covariance structures (COVS).

METHOD

Translation Process

For this study, the 48 CPIC items were translated and adapted into Portuguese by a bilingual English-Portuguese translator to guarantee linguistic cultural equivalence. The translated version was submitted to a committee of three experts in Family and Developmental Psychology to examine not only the semantic equivalence but also the psychological equivalence. The final version was then administered to a small group of participants, who were demographically similar to the sample targeted in this study. In this pilot test participants were interviewed regarding the adequacy and clarity of the instructions, the format of the questionnaire, and the comprehension of the items. Participants responded to the CPIC according to a 6-point scale ranging from 1 (completely disagree) to 6 (completely agree).

Participants

Participants were 677 Portuguese adolescents and emerging adults (61.7% female and 38.3% male), aged 14 to 25 years (Mean = 18.50; SD = 3.00). The majority of the participants (83.9%) came from intact families, and 16.1% reported that their parents were divorced. The mean period since parental separation was 8.52 years (SD = 6.19), and the mean age of the participants at the time of their parents' separation was 10.39 years (SD = 6.13).

To test invariance analysis we split this sample in two developmental groups: adolescents (group 1) and emerging adults (group 2). Group 1: participants included 346 adolescents (55.8% female and 44.2% male) aged 14 to 18 (Mean = 15.96; SD = 1.29); all participants were students and the majority (73.4%) were in public secondary schools (grades 10 to 12). Group 2: participants included 331 emerging adults (68% female and 32% male) aged 19 to 25, with a mean age of 21.15 years (SD = 1.71). The majority of these participants were students in Portuguese universities while others were employed in different professional areas. Most of them (82.5%) were high-school graduates.

Procedure

Data were primarily collected at secondary schools and universities and in a few cases (4.8%) from other respondents using a snowball sampling strategy. All participants were asked for voluntary participation, and the objectives of the study were explained either orally or in writing. Informed consent information was gathered from the directors of the secondary school boards and from the parents of the minor participants. The majority of participants completed the CPIC in the classroom during a regular school/university day. The researcher stayed

in the classroom to answer any specific questions that arose while participants completed the self-report. A smaller group of participants completed the questionnaire at home, having received it in a closed envelope, which they were to return anonymously by regular mail. Participants responded to the CPIC as part of a package of other self-report measures that were used for a larger study on attachment relationships, divorce, and romantic relationships in adolescents and emerging adults. They were asked for voluntary participation in a study about "the importance of human relationships in everyday life." No incentives (fees or extra credit) were offered in exchange for participation.

Model Fit Evaluation

Confirmatory factor analysis was performed using EQS 6.1 (Bentler, 2005). The models tested in this study were estimated using maximum likelihood estimation. Model fit was assessed through a number of indices, the first being a chi-square (χ^2) test. Chi-square is known to be extremely sensitive to sample size, meaning that with larger samples, even reasonable models are likely to produce statistically significant chi-square p values (Bentler, 1990; Bentler & Bonett, 1980; Bryant & Yarnold, 1995; Jöreskog & Sörbon, 1989). In these cases, analysis of the ratio of chi-square to the degrees of freedom (Bryant & Yarnold, 1995) as well as other fit indices is recommended. For this reason the ratio of the chi-square to degrees of freedom will be reported. When this ratio decreases and approaches zero, the fit of the model improves (Hoelter, 1983) and a ratio below 3 is generally considered to be acceptable (Kline, 1998). Two absolute fit indices were used in this study: the Standardized Root Mean Square Residual (SRMR) and the Root Mean Square Error of Approximation (RMSEA). Finally, we used an incremental fit index, namely the Comparative Fit Index (CFI), which is particularly sensitive to complex model specification. Hu and Bentler (1999) recommended a CFI of $>.95$, a SRMR of $<.08$, and a RMSEA of $<.06$ to determine good fit. For the RMSEA, other cutoff values are also suggested: $<.05$ good fit, .05–.08 acceptable fit, .08–.10 mediocre fit and $>.10$ poor fit (Browne & Cudeck, 1993; Byrne, 2006; MacCallum, Browne, & Sugawara, 1996); while for the SRMR, a value of $<.05$ indicates a good-fit (Byrne, 2006).

RESULTS

Reliability

The estimate of reliability of the CPIC was assessed using Cronbach's alpha (Sijtsma, 2009). As shown in Table 1 (includes comparison with the original studies), the three scales presented acceptable reliabilities with Cronbach's alpha ranging from .76 to .92. At the subscale level, and like in Grych's original study,

Coping Efficacy, Self-Blame, and Triangulation presented alphas lower than .70. Only three items revealed an improvement of subscale α if an item was deleted, namely item 3 (Content: α if item deleted .75; "My parents often get into arguments about things I do at school."), item 9 (Frequency: α if item deleted .81; "They may not think I know it, but my parents argue or disagree a lot.") and item 47 (Self-Blame: α if item deleted .60; "Usually it's not my fault when my parents have arguments.").

Inter-scale Correlations

Pearson correlations of the original subscale scores were computed. As expected, Frequency, Intensity, and Resolution (*Conflict Properties* scale) were highly correlated, as were Self-Blame and Content (*Self-Blame* scale). Threat and Coping Efficacy (*Threat* scale) were only moderately correlated. For the two subscales not entered in the three-factor model, we observed that Stability had adequate correlations with the three *Conflict Properties* subscales, while Triangulation was moderately correlated with the three *Conflict Properties* subscales and with the two *Self-Blame* subscales (see Table 2).

Invariance Analysis

We conducted a multiple group analysis to evaluate whether the factor structure of Model 1 and Model 2 at the subscale level of CPIC would be the same across two developmental groups: adolescents (N = 346, 14 to 18 years) and emerging adults (N = 331, 19 to 25 years). Following Byrne's (2006) suggestion, we tested a measurement invariance analysis based on MACS that encompassed a series of hierarchically ordered steps that began with the establishment of a baseline model

TABLE 2
Correlations among CPIC Subscales

	2	3	4	5	6	7	8	9
1. Frequency	.80**	.70**	.45**	.43**	.22**	.12**	.37**	.61**
2. Intensity		.73**	.47**	.46**	.17**	.11**	.38**	.65**
3. Resolution			.34**	.44**	.08*	.06	.38**	.68**
4. Threat				.34**	.21**	.22**	.29**	.35**
5. Coping Efficacy					.20**	.05	.10**	.36**
6. Content						.60**	.36**	.12**
7. Self-Blame							.38**	.05
8. Triangulation								.36**
9. Stability								

** $p < .01$; * $p < .05$.

for each group for Model 1 and Model 2, followed by tests for increasingly more stringent levels of constrained equivalence across adolescents and emerging adults: (1) for configural invariance no equality constraints were imposed on the parameters across the two groups; (2) for metric invariance we constrained factor loadings to be equal while factor variances, error variances, and covariances parameters were free to vary between the two samples; and (3) for scalar invariance ("*strong factorial invariance*," Meredith, 1993) we constrained factor loadings and intercepts to be equal across the two groups. In Model 1, we tested the original factor structure of seven subscales distributed by three factors: Conflict Properties (Frequency, Intensity and Resolution), Threat (Threat and Coping Efficacy), and Self-Blame (Content and Self-Blame) (Grych et al., 1992). In Model 2, in accordance with Bickham and Fiese's (1997) factor structure and with support from our previous correlation analysis, we analyzed whether Stability and Triangulation loaded on the Conflict Properties scale. Model 2 includes three factors with nine subscales: Conflict Properties (Frequency, Intensity, Resolution, Triangulation and Stability), Threat (Threat and Coping Efficacy), and Self-Blame (Content and Self-Blame).

To establish a baseline model, additional CFA was conducted separately for each group. For Model 1, principal indices suggest an adequate model fit for adolescents: CFI = .97; SRMR = .04; RMSEA = .09 (90% CI = .06–.12); χ^2 (11) = 40.859, $p < .001$; $\chi^2/df = 3.71$; and for emerging adults: CFI = .99; SRMR = .02; RMSEA = .05 (90% CI = .00–.08); χ^2 (11) = 19.279, $p = .056$; $\chi^2/df = 1.75$. For Model 2, principal indices revealed a poor model fit for adolescents: CFI = .90; SRMR = .07; RMSEA = .13 (90% CI = .11–.15); χ^2 (24) = 159.690, $p < .001$; $\chi^2/df = 6.65$; and a marginal model fit for emerging adults: CFI = .95; SRMR = .07; RMSEA = .10 (90% CI = .08–.12); χ^2 (24) = 98.182, $p < .001$; $\chi^2/df = 4.09$. Subsequent analyses of modification indices for Model 2 [Lagrange Multiplier Test (LMTest): factor loadings (GVF) and error covariances (PEE)] for adolescents' sample indicated the addition of two new parameters: an error covariance between Stability and Resolution subscales (LMTest χ^2 = 34.375; Parameter Change = .188) and a cross-loading of Triangulation on the Self-Blame factor (LMTest χ^2 = 34.329; Parameter Change = .351). The addition of these two new parameters led to a substantial increase in model fit: CFI = .95; SRMR = .04; RMSEA = .09 (90% CI = .07–.11); χ^2 (22) = 82.978, $p < .001$; $\chi^2/df = 3.77$. This final model is determined to be the baseline model for the adolescent group for Model 2. For the emerging adults' sample LMTest only indicated a cross-loading of Triangulation on the Self-Blame factor (LMTest χ^2 = 32.904; Parameter Change = .309). The addition of this parameter led to an increase in model fit: CFI = .97; SRMR = .04; RMSEA = .06 (90% CI = .04–.09); χ^2 (23) = 55.142, $p < .001$; $\chi^2/df = 2.39$. This final model is determined to be the baseline model for the emerging adult group for Model 2. The loading of Triangulation on the Self-Blame factor in both samples was already expected

TABLE 3
Invariance Analysis

	CFI	SRMR	RMSEA	χ^2	df	$\Delta\chi^2$	Δdf	ΔCFI
Model 1—Configural	.981	.031	.051 (.036–.066)	60.138	22			
Model 1—Metric	.981	.035	.046 (.032–.061)	63.761	26	3,623	4	.000
Model 1—Scalar	.980	.039	.070 (.059–.082)	143.271	33	83,133	11	.001
Model 2—Configural	.966	.041	.055 (.045–.066)	138.125	45			
Model 2—Metric	.963	.054	.054 (.044–.064)	153.686	52	15,561	7	.003
Model 2—Scalar[a]	.965	.048	.064 (.055–.073)	225.407	60	87,282	15	.001
Model 2B—Scalar[b]	.963	.055	.065 (.056–.073)	233.226	61	95.101	16	.003

Note: $\Delta\chi^2$, Δdf, and ΔCFI were the difference between each alternative and the configural model; [a]Stability factor loading was not constrained; [b]Stability factor loading was constrained.

in face of the results from the correlation analysis. The final baseline models for Model 2 are therefore slightly different. As noted by Byrne (2006; Byrne & Stewart, 2006), it is possible that baseline models may not be completely identical across groups because instruments are often group-specific in the way they operate.

After establishing these baseline models we conducted an invariance analysis. Table 3 presents the summary of goodness-of-fit statistics for Model 1 and for Model 2. To determine evidence of invariance we compared the difference values of χ^2, *df*, and CFI from configural, metric, and scalar invariance models. In addition, we examined if all parameters were found to be equivalent across groups by the information provided by LMTest. Cheung and Rensvold (2002) and Byrne (2006) recommended two criteria for evidence of measurement invariance: (1) the multigroup model should exhibit an adequate fit to the data; and (2) $\Delta CFI < .01$. One of the advantages of ΔCFI over the $\Delta\chi^2$ is that it is not as strongly affected by sample size.

Overall goodness-of-fit indices for Model 1 indicated the adequacy of an invariant three-factor model with seven subscales of CPIC across adolescents and emerging adults. Successive examination of the probability values associated with the χ^2 univariate increment information provided by the LMTest for each parameter constraint did not reveal any noninvariant parameter in the metric invariance. However, for scalar invariance, five of seven intercepts were noninvariant.

Results for Model 2 yielded a more modestly well-fitting invariance model. In the metric model invariance LMTest found a noninvariant factor loading between Stability and Conflict Properties factor ($p < .05$); that is, this parameter is not operating equivalently across adolescents and emerging adults, indicating the condition of partial measurement invariance (Byrne, 2006; Byrne, Shavelson, & Muthen, 1989). In the scalar invariance analysis this noninvariant parameter

was allowed to be freely estimated in each group (no equality constraint was imposed) and LMTest revealed additionally six noninvariant intercept parameters. In Table 3 we also report the fit indices for scalar invariance for Model 2 if this parameter (factor loading between Stability and Conflict Properties factor) was also constrained (see Model 2B—Scalar).

CFA at the Subscale and Item Level and Bifactor CFA

Because Model 1 showed a more parsimonious and meaningful solution than Model 2, that did not held well in the individual CFA for adolescents and emerging adults and revealed a noninvariant factor loading; thus, we only conducted a CFA for the complete sample (N = 677) for Model 1 at the subscale level, then a bifactor CFA analysis at the item level for the three specific factor scales, and finally a CFA at the item level for the seven subscales.

Table 4 shows the factor loadings of parameter estimates for Model 1 at the subscale level. The results revealed an acceptable model fit: CFI = .98; SRMR = .03; RMSEA = .08 (90% CI = .06–.10); χ^2 (11) = 58.938, $p < .001$; χ^2/df = 5.36, although the ratio of chi-square to the degrees of freedom is above the recommended value. In general, these fit indices for Model 1 lend support to Grych et al.'s (1992) originally proposed model consisting of three scales and seven subscales.

TABLE 4
Factor Loadings of Parameter Estimates

	B	SE	Z	β
Conflict Properties				
Frequency	1.000			.874
Intensity	1.041	.034	31.004*	.919
Resolution	1.014	.040	25.519*	.795
Self-Blame				
Content	1.000			.971
Self-Blame	.583	.110	5.307*	.614
Threat				
Threat	1.000			.577
Coping Efficacy	.748	.067	11.145*	.581
Conflict Prop.—Self-Blame	.149	.032	4.703*	.199
Conflict Prop.—Threat	.512	.047	10.995*	.866
Self-Blame—Threat	.213	.035	6.183*	.372

Note: B = Unstandardized Parameter Estimate; SE = Standard Error; Z = Test Statistic; β = Standardized Parameter Estimate; Factors are in italic;* $p < .05$.

Due to the correlations between the subscales and the fact that the construct of interparental conflict could be conceptualized as a more general construct, we also wanted to inspect whether the instrument could be represented simultaneously by a general factor and the three specific factors at the item level. In order to address this question we performed a bifactor CFA, providing a more rigorous test of the Grych and Fincham model. We let all items of the seven subscales of CPIC load on a general factor, then we let the Frequency, Intensity, and Resolution items load on a first factor; Threat and Coping Efficacy items load on a second factor; and items from Content and Self-Blame load on a third factor. Table 5 shows the factor loadings of this bifactor analysis.

Almost all items of CPIC showed adequate factor loadings on the general factor and on their own factor, indicating that items were related to overall interparental conflict and to individual subdomains. However, 12 items presented loadings below .30 on the general factor, and one item was nonsignificant (item 8; Self-Blame: "I'm not to blame when my parents have arguments."). In addition, items from Threat factor (Threat and Efficacy subscales) revealed higher factor loadings on the general factor than on their specific factor (item 13: "I don't know what to do when my parents have arguments" and item 39: "When my parents argue I'm afraid that they will yell at me too" presented a nonsignificant loading on their own factor), and contrary to prediction, all items of Threat subscale loaded negatively on the factor. These results may suggest that Threat and Efficacy do not form a factor. In the specific CPIC three factors, item 9 and item 47 again seem to be problematic because they presented a nonsignificant or low loading on their specific factors as well as a low loading on the general factor. Remember that Cronbach's alphas increased if item 9 and 47 were deleted from their original subscales. With the exception of CFI, fit indices were adequate, especially given the complexity of the model: CFI = .84; SRMR = .06; RMSEA = .06 (.05–.06); χ^2 (700) = 2448.376, $p < .001$; $\chi^2/df = 3.50$. As known, while χ^2 is sensitive to sample size, the number of items per factor and the number of factors in the model affect most of the goodness-of-fit indices, the exception being RMSEA (Cheung & Rensvold, 2002).

Finally we wanted to test how the items loaded on their specific seven subscales and particularly see the behavior of the Threat and Efficacy items in their own subscale. Table 5 shows the factor loadings of the CFA at the item level for the seven subscales. Almost all items showed adequate factor loadings on their own subscales. Only three items presented a factor loading below .30 (item 5, 9, and 47). Items from Threat and Efficacy showed adequate loadings on their specific subscale, the exception is item 5 ("When my parents argue I can do something to make myself feel better"). Fit indices were adequate, with CFI = .82; SRMR = .07; RMSEA = .06 (.06–.07); χ^2 (719) = 2647.698, $p < .001$; $\chi^2/df = 3.68$. Although CFI is under the recommended value, again it is not surprising given the complexity of the model.

TABLE 5
CFA and Bifactor CFA at the Item-level of CPIC

		Bifactor CFA—3 Factors				CFA—7 Subscales						
Item	Subscale	G.F.	Conf. Prop.	Threat	Self-Blame	1	2	3	4	5	6	7
1	Frequency	.36[a]	.32[a]			.49[a]						
9	Frequency	.19	−.05[b]			.09						
14	Frequency	.53	.48			.74						
17	Frequency	.48	.52			.71						
26	Frequency	.46	.50			.68						
34	Frequency	.53	.45			.71						
4	Intensity	.60	.33				.65[a]					
12	Intensity	.42	.60				.70					
21	Intensity	.59	.49				.80					
30	Intensity	.61	.51				.83					
35	Intensity	.33	.41				.53					
37	Intensity	.34	.33				.48					
42	Intensity	.35	.36				.50					
2	Resolution	.29	.63					.69[a]				
10	Resolution	.56	.44					.72				
18	Resolution	.32	.62					.72				
27	Resolution	.27	.65					.70				
38	Resolution	.20	.63					.65				
45	Resolution	.59	.48					.78				
6	Threat	.54		−.32					.64[a]			
15	Threat	.53		−.42					.67			
23	Threat	.60		−.51					.77			
32	Threat	.55		−.29					.63			
39	Threat	.56		−.05[b]					.51			
44	Threat	.55		−.31					.63			
5	Efficacy	.10		.31[a]						.26[a]		
13	Efficacy	.49		.03[b]						.47		
22	Efficacy	.20		.48						.43		
31	Efficacy	.56		.41						.66		
43	Efficacy	.44		.20						.48		
48	Efficacy	.57		.18						.59		
3	Content	.14			.35[a]						.38[a]	
19	Content	.20			.71						.72	
28	Content	.26			.73						.76	
36	Content	.34			.57						.66	
8	Self-Blame	−.01[b]			.36							.32[a]
16	Self-Blame	.16			.73							.70
25	Self-Blame	.35			.52							.62
40	Self-Blame	.30			.44							.52
47	Self-Blame	−.13			.28							.20

Note: Factor loadings are from standardized solution; [a]Unstandardized fixed parameter; [b]Unstandardized factor loading was not significant.

DISCUSSION

The purpose of this study was to examine the reliability, the factor validity, and the invariance of the CPIC in a Portuguese sample using confirmatory factor analytic techniques and invariance analysis to test the fit of two different models that have been observed in previous studies. The factor structure of the questionnaire (at the subscale level) observed in the original model by Grych and colleagues (1992) (three-factor model with seven subscales; Model 1) is in general replicated in our sample, a finding that is also consistent with previous empirical studies that showed adequate validity and reliability in other international samples. In fact, there is evidence that the construct of children's perception of marital conflict, based on the CPIC's operationalization, seems to be applicable to and meaningful within Portuguese culture. Once again, the results suggest that feelings of threat, self-blame, and ineffective coping may be related to exposure to frequent, intense, and child-related marital conflict.

Principal fit indices of the Model 2 did not completely corroborate Bickham and Fiese's (1997) three-factor model structure with nine subscales. This model was less parsimonious, revealed one cross-loading and partial measurement invariance. Bickham and Fiese suggested that items pertaining to Triangulation and Stability may require greater cognitive sophistication from respondents, a capacity that older participants may possess but young children may not. Although this suggestion needs to be empirically investigated, it is interesting to notice that Triangulation presents a cross-loading on Self-Blame in our sample. Adolescents and emerging adults who perceive themselves as being triangulated in the conflict between parents tend also to blame themselves for the conflict. Involving the children in interparental conflict and asking them to take one parent's side seems to be overwhelming, even for adolescent and emerging adults who may feel emotionally trapped in the relationship and consider that they are also responsible for parents' arguing. Whether this is a cultural specificity or a developmental specificity needs to be further empirically tested in independent studies.

Configural and metric invariance analysis showed that the original three-factor structure with seven subscales of CPIC can be used across adolescents and emerging adults, indicating that Model 1 works consistently to explain different aspects of interparental conflict in both developmental groups. A more stringent level of constrained equivalence using scalar invariance produced several noninvariant intercepts, although the model exhibited an adequate fit to the data and the difference between CFIs was less than .01. This result should be interpreted cautiously, because intercepts were calculated at the subscale level and not at the item level. Further studies should gather larger samples in order to investigate whether group differences in observed scores can be attributed to differences with respect to the latent dimensions. For Model 2, when metric invariance was tested, only partial measurement invariance was obtained because Stability subscale did not

operate equivalently across adolescents and emerging adults. The scalar invariance analysis produced also several noninvariant intercepts.

When we analyzed the fit indices for both developmental groups in both models separately, we observed that the models fit better in the emerging adults' sample. Although this finding needs to be replicated in other independent samples, it would be interesting to investigate whether older participants are better able to understand the different aspects involved in interparental conflict than younger participants. These results are consistent with findings obtained by Bickham and Fiese (1997) and Reese-Weber and Hesson-McInnis (2008).

A more detailed analysis at the item level was obtained with a bifactor CFA and a CFA for Model 1. In the bifactor CFA the majority of the 48 items of CPIC showed adequate factor loadings on the general factor and on their own factors. The analysis indicated that the items of subscales of Conflict Properties seem to be the most robust. However, items from Threat and Efficacy subscales (Threat factor) produced lower loadings on their own CPIC factor, and the correlation between these two subscales was only moderate. Although these analyses did not support the use of Threat and Efficacy items as indicative of a common factor, the CFA at the item level provided relevant information regarding the independent use of these subscales. In fact, the CFA for the seven subscales at the item level indicated that the majority of the items present adequate factor loadings, and only three items did not show adequate loadings. The problematic behavior of some items was already observed in a previous study that analyzed CPIC at the item level. Nigg et al. (2009) also found that item 5 and 9 presented low loadings on their four-factor solution of CPIC and these were not included in the final solution of 38 items. More studies of CPIC at the item level are needed to clarify whether this result is cultural specific or age specific or whether threat and efficacy, as psychological constructs within the larger conceptual space of interparental conflict, need to be operationalized in another way.

In conclusion, our study provides evidence that CPIC is an appropriate measure to assess specific aspects of interparental conflict in a Portuguese sample of adolescents and emerging adults. Although some subscales of the CPIC scale need to be improved in terms of internal consistency, the confirmatory factor analyses and invariance analyses at the subscale level offer additional support for the cross-cultural factor validity of the CPIC. Analyses at the item level suggest that more refined investigation is needed. Since this instrument has been tested across different cultures, research should progress into a more detailed and comparative analysis of the results obtained in different countries. In addition, the comparison of adolescents' views of interparental conflict with that of other informants such as parents, siblings, or other close household relatives could help indicate which scales are more prone to subjective experience, individual vulnerability, and developmental stages. Future studies should compare factor structure across different family structures (intact, separated, and divorced families) and also explore the

clinical usefulness of the instrument. This instrument could, in fact, help professionals understand how adolescents and emerging adults make meaning of the processes that occur within the family context when marital and parental conflict is present, helping to define important targets for clinical work. The use of this measure in the context of an emotionally close relationship with the counselor may help more defensive adolescents deal with resistance in talking about and facing parental conflict. On the other hand, this measure could also be used as an opportunity for children and adolescents to express feelings and develop emotional regulation strategies for dealing with parental conflict.

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